

WE DELIVER



NASA

Twenty-five years of hands-on experience

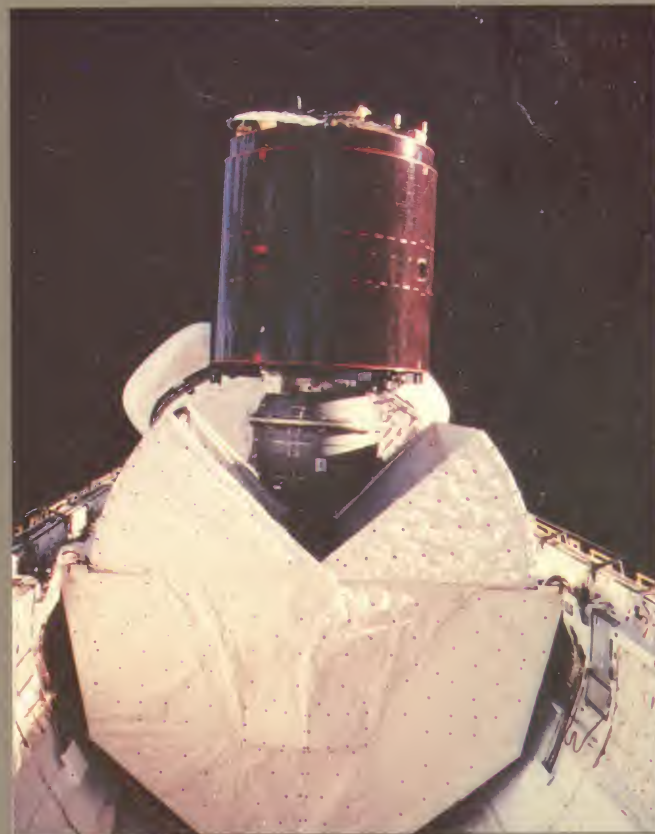


**assures you of the most reliable, flexible, and
cost-effective launch system in the world**

Space Shuttle has established a proven record as the most useful and versatile space transporter ever built. It has also demonstrated a remarkable suitability for delivering communications satellites to earth orbit. The successes of this operational space transportation system speak directly to your launch needs and concerns.

While many new and profitable business opportunities are becoming possible through the Space Shuttle, the primary focus during the 1980's will be on the delivery and operation of telecommunications satellites. Shuttle is ready to launch these satellite payloads; now the goal of the National Aeronautics and Space Administration is to simplify its use. We know this can be done because, with each increasingly smooth flight, there is evidence that we are substantially reducing paperwork and the time a payload must be at the launch site before liftoff. What this will mean to you is lower launch costs and less integration complexity—without compromising reliability or safety.

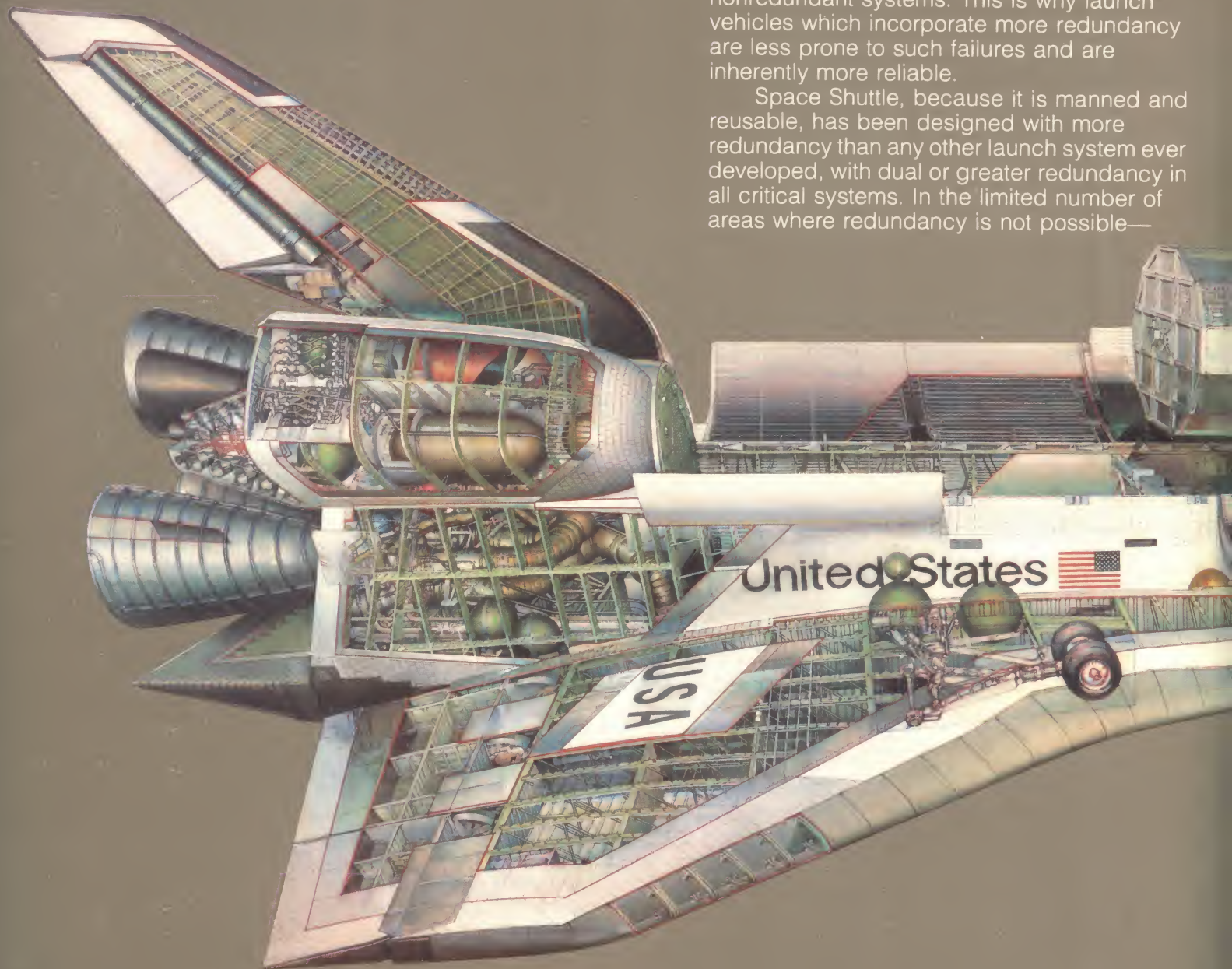
Supported by dedicated, "can-do" contractors, NASA has been launching telecommunications satellites for almost 25 years. In providing launch services for over 100 payloads destined for geostationary orbits, NASA has assembled a team of launch operation experts whose talent, experience, and launch record are unmatched. This team and Shuttle's extraordinary capabilities enable NASA to offer you a cost-effective launch system unequaled by any other existing or planned system on Earth.



You can't beat manned reliability

In launch operations, redundancy is synonymous with reliability. We know from our experience that new or significantly modified launch vehicles normally have relatively high failure rates during early launches, mostly in nonredundant systems. This is why launch vehicles which incorporate more redundancy are less prone to such failures and are inherently more reliable.

Space Shuttle, because it is manned and reusable, has been designed with more redundancy than any other launch system ever developed, with dual or greater redundancy in all critical systems. In the limited number of areas where redundancy is not possible—



such as structures—the Shuttle design provides for a minimum safety factor of 1.25, and in most cases two or three times the failure point. The entire Space Shuttle vehicle is a testament to NASA's longstanding design philosophy for its manned spacecraft—maximum reliability.

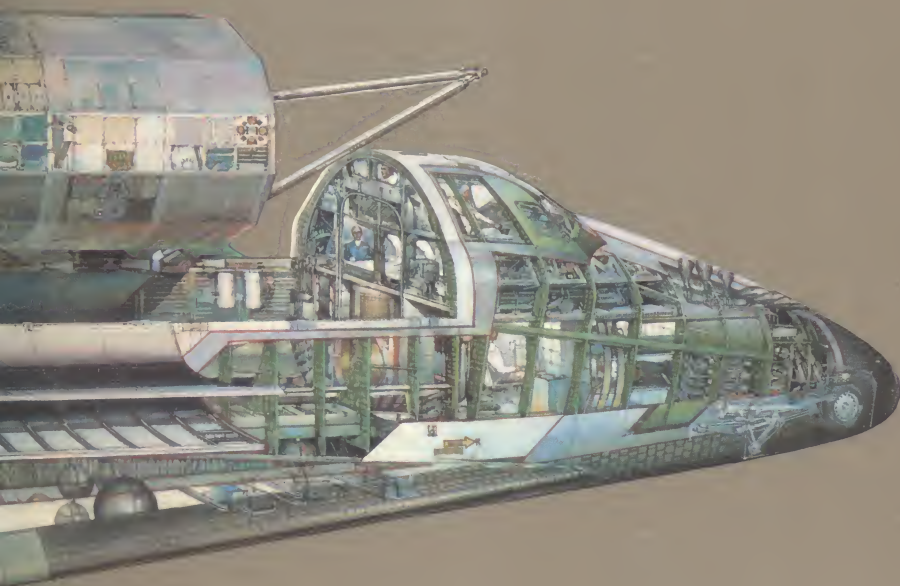
This devotion to reliability has repeatedly paid off for the Shuttle. Some of the problems that occurred on its four test flights—problems that were considered only minor—would have caused launch failures in unmanned launch vehicles. So impressed was the insurance industry that, after only four flights, it lowered

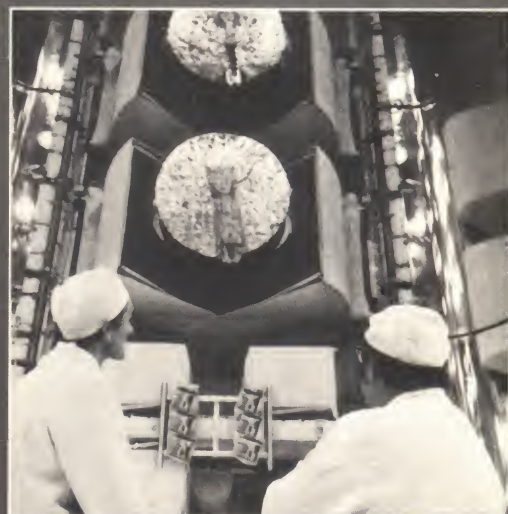
the insurance rates for use of the Space Shuttle. Convinced of the soundness of the Shuttle design and NASA's operational approach, insurance companies set rates for the payloads aboard the first operational Shuttle flight (STS-5) that were 20 percent lower than ever given for an expendable launch vehicle, including the most successful one, Delta, which has been flown more than 170 times.

Redundancy, however, is only one of several reliability assets that the Space Shuttle offers you, and which set it apart from its expendable counterparts. These reliability advantages derive from the unique capabilities of the Shuttle Orbiters and the flight crew. If, for example, a problem should arise during launch or after orbit insertion necessitating a mission abort (a risk estimated to be less than three percent), the Orbiter would return to Earth for a controlled landing. Your payload—instead of being lost, as would occur with an expendable launch vehicle—would be safe and ready for relaunch after only minimal further checkout. The number of payloads (designed to the same specifications as telecommunications satellite payloads) that have been planned for and successfully flown on roundtrips aboard the Shuttle have demonstrated the benign return trip environment of the Shuttle.

Moreover, Shuttle alone gives you an opportunity, once in orbit, to check out your payload and to make an unhurried decision on whether or not to proceed with deployment. Should there be significant doubt about the condition of your payload, it can be returned to Earth with the Orbiter, for relaunch on another day.

Finally, the Space Shuttle offers flexibility and expanded capabilities that provide the opportunity to significantly improve satellite designs by taking advantage of the new features that only the Shuttle provides. Such an integral design approach will offer you, the customer, the maximum benefits of the world's most versatile, operational space transportation system.





Schedule assurance with flexibility, upon which you can depend

Launch schedule flexibility and assurance, although seemingly contradictory, are key to the success of any space venture. With this in mind, NASA will commit to the launch schedule for your payload with no caveats linking that commitment to other payloads assigned to share your flight. In other words, NASA will launch your payload, even if your launch partner fails to show up for launch. This principle was most vividly demonstrated on the STS-8 launch, when NASA kept its commitment to launch the Indian National Satellite INSAT payload as schedule, even after its companion payload was removed from the flight.

From the standpoint of payload availability, NASA is committed to provide replacement and reflight launch services within six to nine months of notification. This commitment assures you of the ability to maintain an operational satellite system, once it has been established. Launch scheduling flexibility can be further improved by planning an entire series of payload launches on the Shuttle, thereby providing built-in flexibility through multiple launch scheduling. This is of particular importance for the first launch of a new payload design where on-time delivery of the first payload may be a concern. By scheduling the first several launches within three to six months of each other, late delivery of the first payload would be accommodated no later than the launch date planned for the second payload.

NASA recognizes the concern of some that discovery of a generic problem in the Shuttle design could suddenly cripple the Shuttle flight schedule, but history suggests that such a concern is unfounded. The Space Shuttle has flown a string of spectacularly

successful missions. There will be three Orbiters in the operational fleet by the end of 1983 and a fourth scheduled for delivery in 1984. While there is the remote possibility that a generic design flaw could ground the entire Shuttle fleet, such a possibility exists for any launch vehicle. A review of our manned missions shows that such problems result in flight delays of only a few months. But if a problem were to become a grave threat to Shuttle operations, the involvement of the Department of Defense in the Shuttle program ensures that a lengthy delay would not be tolerated. Any problem that could ground the Shuttle fleet would attract the resources as well as the urgent attention of the United States government. We have no doubt that the problem would be quickly solved.





In all the world, you won't find Shuttle's equal

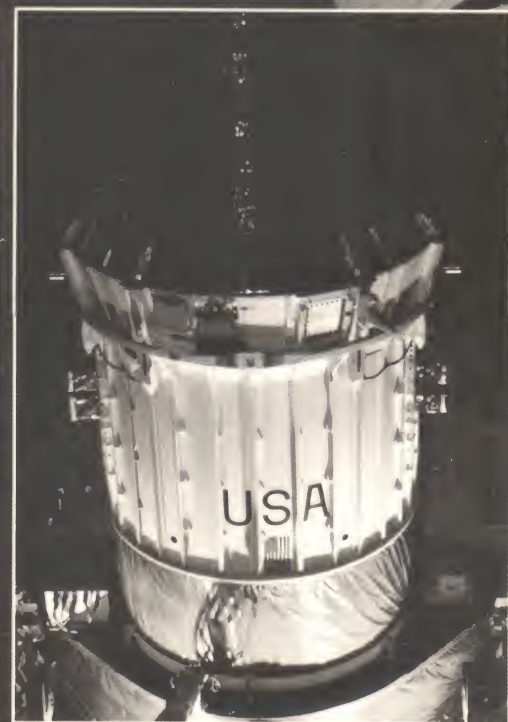
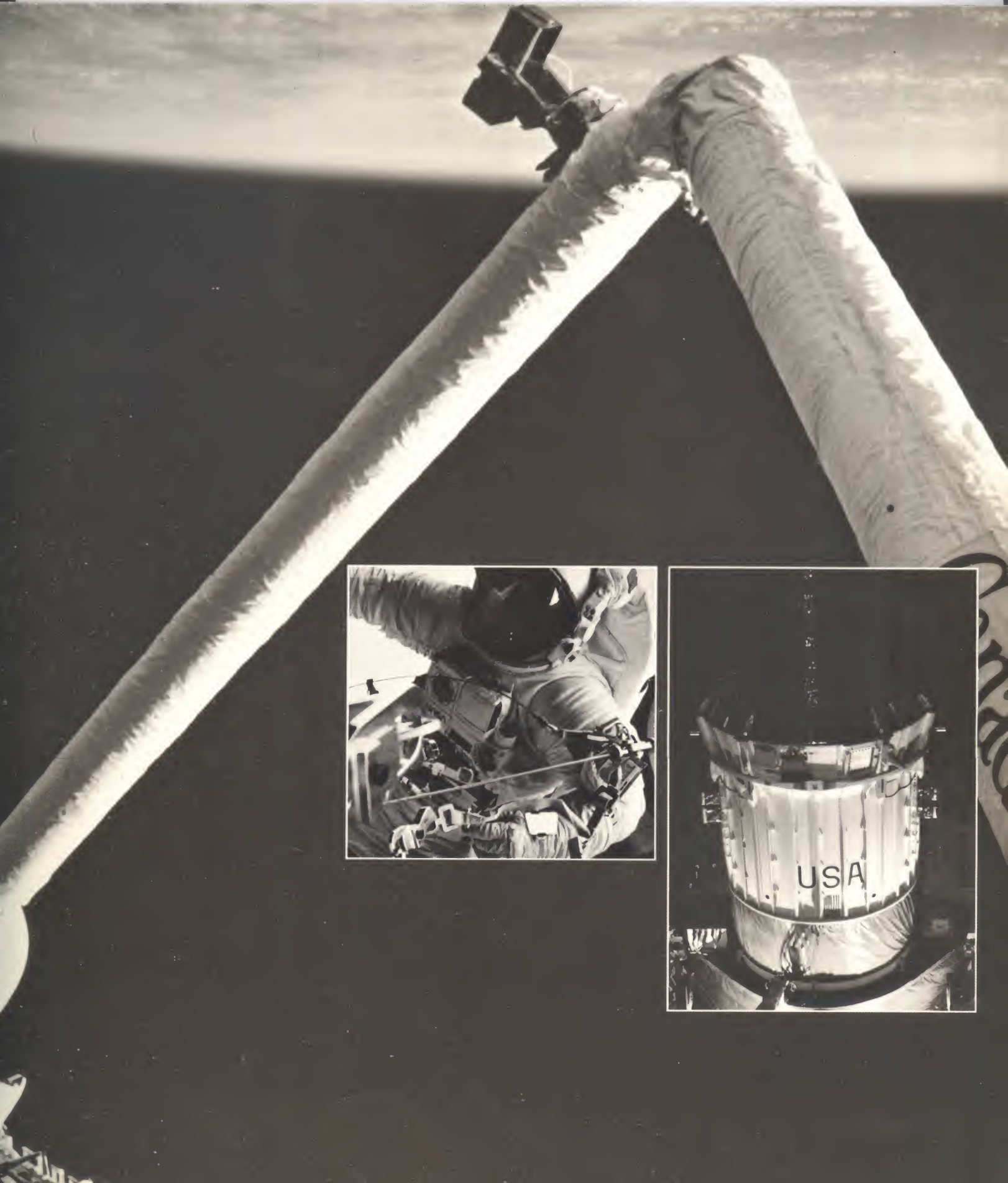
NASA recognizes the large investment required for any space venture and appreciates the importance of accurate placement of your payload in orbit. We also understand—after a quarter-century of experience—what it takes to launch payloads into space, time after time after time. In short, we know how to deliver.

For the launching of your payload, we offer an unparalleled combination—the world's most reliable space transporter and a launch team that is internationally recognized for its experience and successes. Praised by every crew that has flown it, the Space Shuttle is launched by people who never compromise their first objective—to launch safely and successfully. This was dramatically demonstrated on the first flight of the Challenger (STS-6). Although engine problems caused a launch delay of several weeks, we painfully took the time necessary to

understand the technical problem and the potential for trouble in flight. As a result, STS-6 was a resounding success and the experience gained taught us valuable lessons that are being applied to test and flight preparations for all future flights.

NASA will have four Orbiters—Columbia, Challenger, Discovery, and Atlantis—in operation by 1985. By the end of 1985 we will have flown more than 30 Shuttle missions, nearly half involving deployment of payloads. We are confident that the Space Shuttle fleet and its launch team can give you the surest, safest, and most cost-effective launch service obtainable anywhere in the world.





You can't get a better price

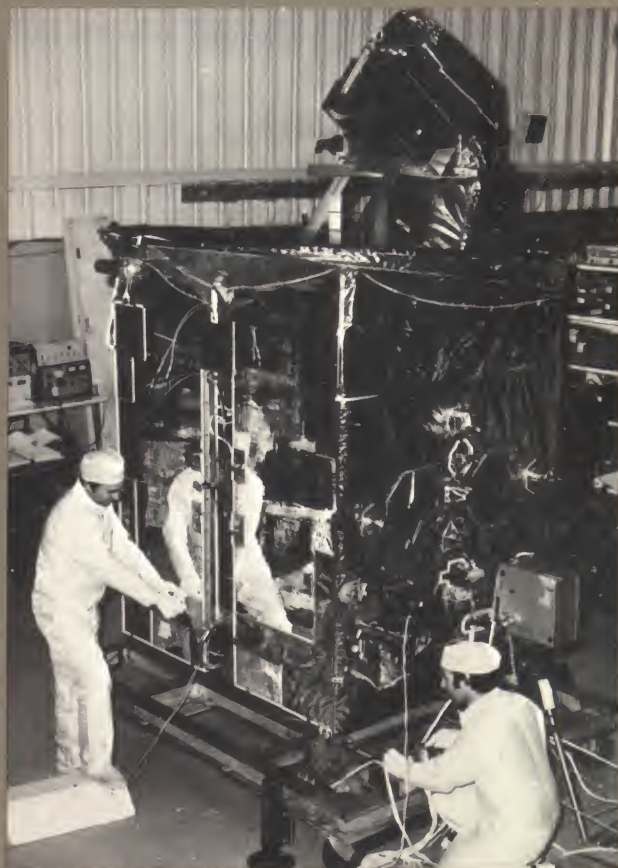
The price for launching a payload on the Shuttle is based on the share of the lifting weight and cargo bay length required by your payload. Pricing according to this continuous curve formula, assures that you will be charged only for your requirements, while retaining the significant growth capability inherent in the Shuttle in the event those requirements change during the period you are developing your payload. The Shuttle price and pricing flexibility cannot be matched by any other launch system.

In evaluating the total cost associated with a launch, two other important factors must be considered, both involving insurance. One is the effect that NASA's launch record and experience has had on insurance rates. It has been demonstrated that this record commands for the Shuttle the lowest insurance rates in the free world. A difference of a few percentage points in the insurance rates for a satellite or other payload program can easily mean millions of dollars saved in the insurance purchased for your launch.

The other insurance consideration involves the charges associated with postponing a payload launch on the Shuttle. We have a commitment to all of our customers to launch on time, and we recognize the importance of their cash-flow demands.

Therefore, as an incentive for customers to make all reasonable effort to have their payloads delivered for launch on the agreed schedule, we have established significant postponement fees. On the other hand, we appreciate the cost risk associated with postponements. Here again, the insurance industry has demonstrated its support of the Shuttle by agreeing to provide insurance, at low premium rates, to cover the postponement fees.

Considering all cost factors associated with launching your satellite or other payload into space, you can't get a better price or more for your money than the Space Shuttle.





NASA



National Aeronautics and
Space Administration
Twenty-fifth Anniversary
1958-1983